

WE CLAIM:

1. In a method of making a permeable fibrous mat on a wet process mat machine in which an aqueous slurry containing fibers is continuously deposited onto the top surface of a moving permeable forming belt, partially dewatered, followed by drying the wet web to produce a dry non-woven fibrous mat, the improvement comprising applying a foam or froth onto the wet web after said web has been partially dewatered, the foam or froth having a high percentage of air having a blow ratio of at least about 12, the foam forming less than 5 milliliters of liquid in the bottom of an Imhoff cone after 16 hours from the time of filling the cone to a one liter mark and a viscosity of at least about 200 centipoise, and applying said foam at a rate to produce a dry, mat having a coating on one face, the mat having a permeability of at least about 150 CFM/sq. ft.

2. The method of claim 1 wherein an aqueous binder is first applied to the wet, partially dewatered web and the wet, bindered web is passed over a suction box to reduce the binder content to a desired level prior to applying the foam or froth onto the top surface of the wet web.

3. The method of claim 1 wherein at least the majority of the fibers are glass fibers and said foam is applied at a rate to produce a dry mat having a permeability of at least about 150 CFM/sq. ft.

4. The method of claim 1 wherein said foam is applied at a rate to produce a dry mat having a permeability of at least about 350 CFM/sq. ft.

5. The method of claim 1 wherein said foam is applied at a rate to produce a dry mat having a permeability of at least about 500 CFM/sq. ft.

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6. The method of claim 1 wherein the foam has a blow ratio between about 15 and about 30.

7. The method of claim 3 wherein the foam has a blow ratio between about 15 and about 30.

8. The method of claim 4 wherein the foam has a blow ratio between about 15 and about 30.

9. The method of claim 5 wherein the foam has a blow ratio between about 15 and about 30.

10. The method of claim 1 wherein the amount of liquid formed in the bottom of the Imhoff cone is less than about 2 milliliters.

11. The method of claim 6 wherein the amount of liquid formed in the bottom of the Imhoff cone is less than about 2 milliliters.

12. The method of claim 7 wherein the amount of liquid formed in the bottom of the Imhoff cone is less than about 2 milliliters.

13. The method of claim 8 wherein the amount of liquid formed in the bottom of the Imhoff cone is less than about 2 milliliters.

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14. The method of claim 9 wherein the amount of liquid formed in the bottom of the Imhoff cone is less than about 2 milliliters.

15. The method of claim 3 wherein the amount of liquid formed in the bottom of an Imhoff cone filled with foam and allowed to age is less than about 2 milliliters.

16. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 1.

17. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 2.

18. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 3.

19. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 5.

20. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 6.

21. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 10.

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22. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 15.

23. A laminate comprising a first material layer bonded to a second layer of a nonwoven fibrous mat, the mat having an exposed foam coating and made by the process described in claim 1.

24. A laminate comprising a first material layer bonded to a second layer of a nonwoven fibrous mat, the mat having an exposed foam coating and made by the process described in claim 2.

25. The laminate of claim 24 wherein the first layer is gypsum board.

26. The laminate of claim 24 wherein the first layer is a light-weight insulating material.

27. In a method of making a permeable fibrous mat on a wet process mat machine in which an aqueous slurry containing fibers is continuously deposited onto the top surface of a moving permeable forming belt, partially dewatered, followed by applying an excess of aqueous binder, removing excess aqueous binder to form a wet, bindered web and drying the wet, bindered web to produce a dry non-woven fibrous mat, the improvement comprising applying a foam or froth onto the wet, bindered web after said web, the foam or froth having a high percentage of air having a blow ratio of at least about 12, the foam forming less than 5 millimeters of liquid in the bottom of an Imhoff cone after 16 hours from filling and a viscosity of at least about 200 centipoise, and applying said foam at a rate to produce a dry, mat having a coating on one face, the mat having a permeability of at least about 150 CFM/sq. ft.

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28. The method of claim 27 wherein at least the majority of the fibers are glass fibers and said foam is applied at a rate to produce a dry mat having a permeability of at least about 200 CFM/sq. ft.

29. The method of claim 28 wherein said foam is applied at a rate to produce a dry mat having a permeability of at least about 350 CFM/sq. ft.

30. The method of claim 29 wherein said foam is applied at a rate to produce a dry mat having a permeability of at least about 500 CFM/sq. ft.

31. The method of claim 27 wherein the foam has a blow ratio of at least about 25.

32. The method of claim 28 wherein the foam has a blow ratio of at least about 25.

33. The method of claim 29 wherein the foam has a blow ratio of at least about 25.

34. The method of claim 30 wherein the foam has a blow ratio of at least about 25.

35. The method of claim 27 wherein the amount of liquid formed in the bottom of an Imhoff cone filled with said foam and aged is less than about 2 millimeters.

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36. The method of claim 31 wherein the amount of liquid formed in the bottom of an Imhoff cone filled with foam and aged is less than about 2 millimeters.

37. The method of claim 32 wherein the amount of liquid formed in the bottom of an Imhoff cone filled with foam and aged is less than about 2 millimeters.

38. The method of claim 33 wherein the amount of liquid formed in the bottom of an Imhoff cone filled with said foam and aged is less than about 2 millimeters.

39. The method of claim 34 wherein the amount of liquid formed in the bottom of an Imhoff cone filled with foam and aged is less than about 2 millimeters.

40. The method of claim 28 wherein the amount of liquid formed in the bottom of an Imhoff cone filled with foam and allowed to age is less than about 2 millimeters.

41. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 27.

42. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 28.

43. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 29.

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44. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 30.

45. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 31.

46. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 40.

47. A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim 32.

48. A laminate comprising a first material layer bonded to a second layer of a nonwoven fibrous mat, the mat having an exposed foam coating and made by the process described in claim 27.

49. A laminate comprising a first material layer bonded to a second layer of a nonwoven fibrous mat, the mat having an exposed foam coating and made by the process described in claim 28.

50. The laminate of claim 49 wherein the first layer is gypsum board.

51. The laminate of claim 49 wherein the first layer is a light-weight insulating material.

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52. The method of claim 1 in which the foam is applied by spraying the aqueous foam through spray nozzles located above the wet web.

53. The method of claim 7 in which the foam is applied by spraying the aqueous foam through spray nozzles located above the wet web.

54. The method of claim 27 in which the foam is applied by spraying the aqueous foam through spray nozzles located above the wet web.

55. The method of claim 28 in which the foam is applied by spraying the aqueous foam through spray nozzles located above the wet web.

56. The method of claim 32 in which the foam is applied by spraying the aqueous foam through spray nozzles located above the wet web.

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